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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/581,752

12/20/2006

Bhavana Deore

17522NP

8507

293 7590 04/05/2011

DOWELL & DOWELL P.C.

103 Oronoco St.

Suite 220

Alexandria, VA 22314

EXAMINER

FANG, SHANE

ART UNIT

PAPER NUMBER

1766

MAIL DATE

DELIVERY MODE

04/05/2011

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/581,752	DEORE ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	SHANE FANG	1766	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 16 February 2011.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1,2,6,7,10-24 and 26-28 is/are pending in the application.
- 4a) Of the above claim(s) 10-14 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2,6,7,15-24,26-27 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### *Response to Amendment*

- The amendment of claims 1-2, 6-7, 15-24, 26 and new claims 27-28 are supported by the original claims and 0060.
- The previous ODP over 12/161235 have been overcome by amendment.
- The previous 102 rejections over Shoji et al. or Freund have been overcome by amendment.
- All previous rejections of claims 3-5 and 25 have been rendered moot by cancellation.
- All previous 103 rejections of claims 20 and 25-26 over Freund et al. in view of Mattoso et al. or over Shoji et al. in view of Mattoso et al. have been **maintained**.
- The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

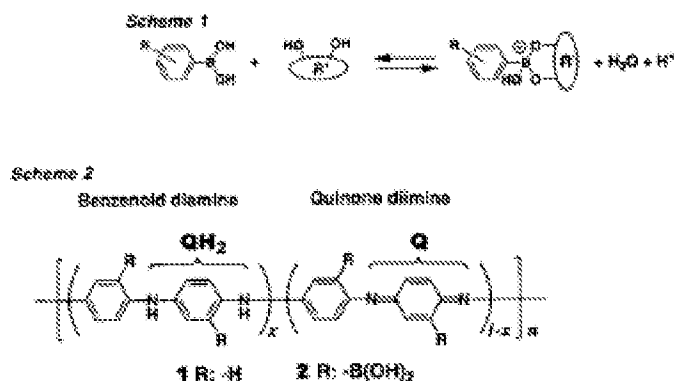
### *Claim Rejections - 35 USC § 103*

1. Claims 1-2, 6-7, 15-24, and 26-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shoji et al. (JACS 2002, 124, 12486-12493) listed on IDS and ISP in view of Mattoso et al. (Synthetic Metals, 68 (1994), 1-11) listed on IDS.

As to claims 1-2, 6-7, 15-24, and 26-28, Shoji discloses a conductive poly(3-aminophenylboronic acid) capable of converting between a water-soluble self-doped form and a water-insoluble non-self doped form by a reversible chemical reaction by

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exposing poly(3-aminophenylboronic acid) in D-fructose in PBS based on the following schemes (Pg. 12487, abs., Experimental Section, 12488, col. 1, 12489, Fig. 2):



and

Shoji is silent on the MW of the polyanilines as recited in claims 1, 20, and 26.

Mattoso discloses increasing the MW to 64-90k of polyanilines by successive oxidation and further increasing the MW to 156k or 160k by using polyvinylsulfonic acid or ammonium peroxydisulfate for oxidative polymerization (Pg. 1, col. 1-2). Mattoso teaches having high MW is highly desirable (Pg. 1, col. 1). One of ordinary skill in the art would obviously recognize to increase MW of a polymer for improving its film forming capability and mechanical strength.

Therefore, as to claims 1-2, 6-7, 15-24, and 26-28, it would have been obvious to one of ordinary skill in the art at the time of the invention to have modified the polyaniline disclosed by Shoji and increased MW to the claimed ranges in view of Mattoso, because the resultant higher MW polyaniline would yield improved film forming capability and mechanical strength.

Particular to claims 1 and 15, although and Mattoso are silent on the reversible reactions between boronic acid of the polyaniline with D-fructose in presence of fluoride,

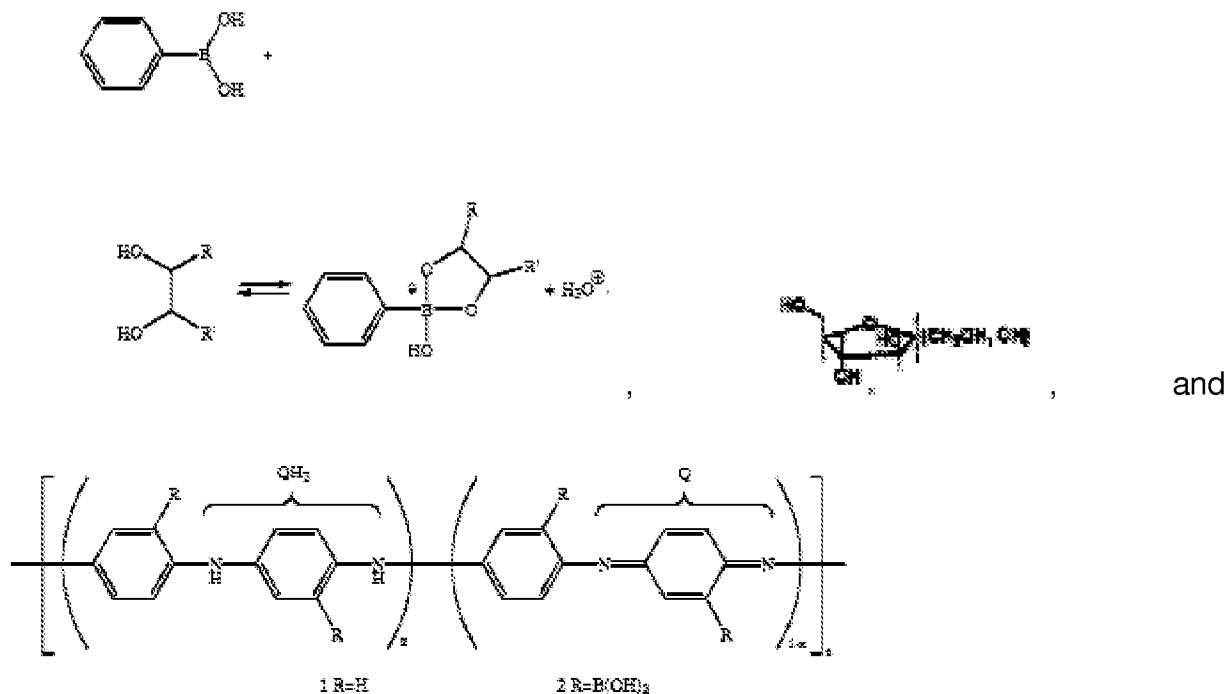
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this limitation is construed as part of the inherent property. The resultant polymer meets the structures of claims 1 and 6, because formulae 2 and 3 of claim 6 are also construed as part of the inherent property of claimed polyaniline capable of converting between formula 2 and 3 with D-fructose in presence of fluoride. What claimed is a polyaniline. Shoji and Mattoso are silent on the hardness of the polyaniline dried film of instant claims 2, 7, 16-19, 21-24, and 27-28. However, one ordinary skill in the art would have expected the process (and the resulting product) disclosed by Shoji and Mattoso to feature the same hardness and other property because they obviously satisfy all of the material and chemical limitations of the instant invention-see MPEP 2112.01.

2. Claims 1-2, 6-7,15-24, and 26-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Freund et al. (US 20020029979) listed on IDS and ISP in view of Mattoso et al. (Synthetic Metals, 68 (1994), 1-11) listed on IDS.

As to claims 1-2, 6-7,15-24, and 26-28, Freund discloses a conductive poly(3-aminophenylboronic acid) capable of converting between a water-soluble self-doped form and a water-insoluble non-self doped form by a reversible chemical reaction by exposing poly(3-aminophenylboronic acid) in D-fructose in PBS based on the following schemes (0029-31, 0046-48, Fig. 2, claims 1-30):

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Freund is silent on the MW of said polyanilines as recited in claims 1, 20, and 26.

Mattoso discloses increasing the MW to 64-90k of polyanilines by successive oxidation and further increasing the MW to 156k or 160k by using polyvinylsulfonic acid or ammonium peroxydisulfate for oxidative polymerization (Pg. 1, col. 1-2). Mattoso et al. teaches having high MW is highly desirable (Pg. 1, col. 1). One of ordinary skill in the art would obviously recognize to increase MW of a polymer for improving its film forming capability and mechanical strength.

Therefore, as to claims 1-2, 6-7, 15-24, and 26-28, it would have been obvious to one of ordinary skill in the art at the time of the invention to have modified the polyaniline disclosed by Freund and increased MW to the claimed ranges in view of Mattoso, because the resultant higher MW polyaniline would yield improved film forming capability and mechanical strength.

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Particular to claims 1 and 15, although Freund and Mattoso are silent on the reversible reactions between boronic acid of the polyaniline with D-fructose in presence of fluoride, this limitation is construed as part of the inherent property. The resultant polymer meets the structures of claims 1 and 6, because formulae 2 and 3 of claim 6 are also construed as part of the inherent property of claimed polyaniline capable of converting between formula 2 and 3 with D-fructose in presence of fluoride. What claimed is a polyaniline. Freund and Mattoso are silent on the hardness of the polyaniline dried film of instant claims 2, 7, 16-19, 21-24, and 27-28. However, one ordinary skill in the art would have expected the process (and the resulting product) disclosed by Freund and Mattoso to feature the same hardness and other property because they obviously satisfy all of the material and chemical limitations of the instant invention-see MPEP 2112.01.

### ***Response to Arguments***

The argument for allowance of amended claims has been fully considered but not persuasive.

The applicant argued individually (Pg. 4-5, 9) Shoji fails to disclose a boronic acid containing polyaniline having MW at least 100k and Mattoso fails to disclose a boronic acid containing polyaniline capable of converting. One cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See MPEP-2145.

The applicant argued combining Mattoso and Shoji does not provide reasonable probability of success (Pg. 5) without showing evidence. This argument is not persuasive. Evidence showing there was no reasonable expectation of success may support a conclusion of nonobviousness. In re **Rinehart**, 531 F.2d 1048, 189 USPQ 143 (CCPA 1976).

The applicant argued (Pg.5, 8-9) Shoji and Mattoso fail to disclose polymerization in "D-fructose and fluoride" and a polyaniline polymer capable of converting between structures as recited in claim 6. What claimed is a boronic acid substituted polyaniline capable of "...", and the polyaniline of Shoji and Mattoso meets the claim. These limitations are met based on the inherency rationale of above ¶1.

The applicant argued (Pg. 6-7, 10) Mattoso discloses the MW is decreased via using LiF in attempt to defeat the previous 103 rejections (Pg.20-25). Mottoso does not suggest polymerization in presence of fluoride and D-fructose, but this is not claimed either. The fluoride recited in claim 1 and 6 is used in complexation, not for polymerization or modifying MW. Using LiF together with agar and resultant decrease of MW is merely one finding of Mottoso. The MW is further increased by lowering the reaction temperature even LiF is used. One of Mottoso's objectives is to increase the MW via using polyvinylsulfonic acid or ammonium peroxydisulfate for oxidative polymerization, and using LiF, NaCl, CaCl<sub>2</sub>, and LiNO<sub>3</sub> increases the MW of polymer produced. MW to 156k or 160k is achieved by using polyvinylsulfonic acid or ammonium peroxydisulfate for oxidative polymerization (Pg. 1, col. 1-2). In light of this,



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in view of the reference in whole, Mottosso does not teach away from the present invention.

Therefore, as to claims 1-2, 6-7, 15-24, and 26-28, it would have been obvious to one of ordinary skill in the art at the time of the invention to have modified the polyaniline disclosed by Shoji and increased MW to the claimed ranges in view of Mattoso, because the resultant higher MW polyaniline would yield improved film forming capability and mechanical strength.

Therefore, the previous rejections of 20 and 25-26 over Shoji in view of Mattoso have been **maintained**.

The applicant argued individually (Pg. 12-17) Freund fails to disclose a boronic acid containing polyaniline having MW at least 100k and Mattoso fails to disclose a boronic acid containing polyaniline capable of converting. One cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See MPEP-2145.

The applicant argued (Pg. 13, 15-16) Mattoso discloses the MW is decreased via using LiF in attempt to defeat the previous 103 rejections (Pg.20-25). Mottoso does not suggest polymerization in presence of fluoride and D-fructose, but this is not claimed either. The fluoride recited in claim 1 and 6 is used in complexation, not for polymerization or modifying MW. Using LiF together with agar and resultant decrease of MW is merely one finding of Mottoso. The MW is further increased by lowering the reaction temperature even LiF is used. One of Mottoso's objectives is to increase the MW via using polyvinylsulfonic acid or ammonium peroxydisulfate for oxidative

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polymerization, and using LiF, NaCl, CaCl<sub>2</sub>, and LiNO<sub>3</sub> increases the MW of polymer produced. MW to 156k or 160k is achieved by using polyvinylsulfonic acid or ammonium peroxydisulfate for oxidative polymerization (Pg. 1, col. 1-2). In light of this, in view of the reference in whole, Mattosso does not teach away from the present invention.

The applicant argued (Pg.14-17) Freund and Mattoso fail to disclose polymerization in "D-fructose and fluoride" and a polyaniline polymer capable of converting between structures as recited in claim 6. What claimed is a boronic acid substituted polyaniline capable of "...", and the polyaniline of Freund and Mattoso meets the claim. These limitations are met based on the inherency rationale of above ¶2.

Therefore, as to claims 1-2, 6-7, 15-24, and 26-28, it would have been obvious to one of ordinary skill in the art at the time of the invention to have modified the polyaniline disclosed by Freund and increased MW to the claimed ranges in view of Mattoso, because the resultant higher MW polyaniline would yield improved film forming capability and mechanical strength.

Therefore, the previous rejections of 20 and 25-26 over Freund in view of Mattoso have been **maintained**.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SHANE FANG whose telephone number is (571)270-7378. The examiner can normally be reached on Mon.-Thurs. 8 a.m. to 6:30 p.m. EST..

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski can be reached on (571) 272-1302. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Sf

/RANDY GULAKOWSKI/  
Supervisory Patent Examiner, Art Unit 1766